

IN THE UNITED STATES PATENT OFFICE

In re application of:	Grier et al.)
Serial No:	09/845,045	) Group Art Unit: 1775
Filed:	April 27, 2001	) Examiner: M. Y. Sikder
For:	APPARATUS FOR USING OPTICAL TWEEZERS TO MANIPULATE MATERIALS	) Attny Dkt No. 40563/139

DECLARATION

I, Brian Koss, do hereby declare and state that:

I am a Ph.D. graduate student at the University of Chicago working under Professor David Grier to complete my Ph.D. thesis.

In the year 2001, I devoted substantial time to laboratory work and to meetings and discussions with Professor Grier, Dr. DuFresne and Ms. Jennifer Curtis regarding the subject matter of a method and apparatus for use of optical tweezers to manipulate material.

During these interactions and during work performed in the laboratory, I contributed jointly with the others (Grier, DuFresne and Curtis) to developing concepts associated in particular with the use of laser light to form optical tweezers for use in manipulating biological materials without damaging the material. In addition we worked together to determine particular combinations of low absorption coefficient by the biological material, laser intensity level and various laser modes to avoid damage to the material.

In about April, 2001 I prepared an Invention Disclosure form and submitted it to UC Tech of the University of Chicago with the intent that I be considered as a possible inventor of patent application which involved description of use of certain laser light wavelengths for making optical tweezers for manipulating biological materials.

Subsequently, I was not informed about nor received any information about the patent application and did not address the matter again until very recently when Professor Grier related that a patent was going to issue. I then spoke with Dr. Ginsburg at UC Tech who put m in

touch with Mr. Michael Rechtin, patent attorney for the University of Chicago.

In my discussions with Mr. Rechtin, he advised me to review the patent application including the final set of patent claims which had been allowed. He further instructed me to consider certain features of the patent claims which he believed constituted new, patentable elements or combinations of elements which were the basis of allowance of the patent claims. Mr. Rechtin further advised me to consider those features and advise him whether I had alone, or together with others, conceived these ideas. I then prepared a brief outline of my overall contribution and how they came into being. After a number of detailed discussions, Mr. Rechtin concluded, as a patent attorney, that I had contributed a number of ideas which established I should be added as an inventor on all the patent claims.

I further declare that to my knowledge and belief my not being included as an inventor (in the initial draft of the disclosure) did not involve any deceptive intent by myself or anyone else at the University of Chicago or by Mr. Rechtin.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

5-1-02

Date

Brian Koss

Brian Koss

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on May 14, 2002

Christina Kozbi

Name

Christina Kozbi

Signature

Atty. Dkt. No. 40563/139

SUPPLEMENTAL DECLARATION

As a below named inventor, I HEREBY DECLARE:

My residence, post office address, and citizenship are as stated below next to my name;

I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

APPARATUS FOR USING OPTICAL TWEEZERS TO MANIPULATE MATERIALS

the specification of which (check one)

☐ is attached hereto.
☒

was filed on April 27, 2001 as United States Application Number or PCT International Application Number 09/845,045

I hereby declare that the subject matter of the (check one)

☐ attached amendment
☒

amendment filed on February 4, 2002

was part of my or our invention and was invented before the filing date of the above-identified original application for such invention.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations; § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number	Country	Foreign Filing Date	Priority Claimed?	Certified Copy Attached?

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

U.S. Provisional Application Number	Filing Date

Atty. Dkt. No. 40563/139

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or § 365(c) of any PCT International application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Application Number	Parent Filing Date	Parent Patent Number

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of second inventor

Brian A. Koss

Residence

Chicago, Illinois

Citizenship

United States

Post Office Address

7631 S. South Shore Drive, 1st Floor
Chicago, Illinois 60649

Inventor's signature



Date

5-8-02

IN THE UNITED STATES PATENT OFFICE

In re application of:	Grier et al.)
)
Serial No:	09/845,045	) Group Art Unit: 1775
)
Filed:	April 27, 2001	) Examiner: M. Y. Sikder
)
For:	APPARATUS FOR USING OPTICAL	) Attny Dkt No. 40563/139
	TWEEZERS TO MANIPULATE)
	MATERIALS)

DECLARATION

I, Jennifer Curtis, do hereby declare and state that:

I am a Ph.D. graduate student at the University of Chicago working under Professor David Grier to complete my Ph.D. thesis.

In the year 2001, I devoted substantial time to laboratory work and to meetings and discussions with Professor Grier, and Mr. Brian Koss regarding the subject matter of a method and apparatus for use of optical tweezers to manipulate material.

During these interactions and during work performed in the laboratory, I contributed jointly with the others (Grier, Dufresne and Koss) to developing concepts associated in particular with the use of laser light to form optical tweezers for use in manipulating biological materials without damaging the material. In addition we worked together to determine particular combinations of low absorption coefficient by the biological material, laser intensity level and various laser modes to avoid damage to the material.

In about April, 2001 I recall completing an Invention Disclosure form and submitting it to UC Tech of the University of Chicago with the intent that I be considered as a possible inventor on a patent application which involved use of a particular range of laser wavelength light for making optical tweezers for manipulating biological materials.

Subsequently, I do not recall receiving any information about the patent application and did not address the matter again until very recently when Professor Grier told me that a

patent was going to issue. Professor Grier encouraged me to speak with Mr. Michael Rechtin, the patent attorney for the University of Chicago.

In my discussions with Mr. Rechtin, he advised me to review the patent application, including the final set of patent claims which had been allowed. He further instructed me to consider certain features of the patent claims which he believed constituted new, patentable features which were the basis of allowance of the patent claims. Mr. Rechtin further advised me to consider those features and advise him whether I had alone, or together with others, conceived these ideas. I then prepared a brief outline of my overall contribution and how they came into being. After several discussions with me, Mr. Rechtin concluded, as a patent attorney, that I had contributed a number of ideas which established I should be added as an inventor on most of the patent claims.

Regarding the various patent claims which have been allowed, after a telephone discussion and an exchange of emails with Mr. Rechtin and also review of the patent application and claims to issue, I believe I am a co-inventor.

I further declare that to my knowledge and belief my not being included as an inventor did not involve any deceptive intent by myself or anyone else at the University of Chicago or by Mr. Rechtin.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: May 3, 2002

Jennifer Curtis
Jennifer Curtis

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on May 14, 2002

Christine Keziol
Christine Keziol
Name
Christine Keziol
Signature

SUPPLEMENTAL DECLARATION

As a below named inventor, I HEREBY DECLARE:

My residence, post office address, and citizenship are as stated below next to my name;

I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

APPARATUS FOR USING OPTICAL TWEEZERS TO MANIPULATE MATERIALS

the specification of which (check one)

 is attached hereto.

 X was filed on April 27, 2001 as United States Application Number or
PCT International Application Number 09/845,045

I hereby declare that the subject matter of the (check one)

 attached amendment

 X amendment filed on February 4, 2002

was part of my or our invention and was invented before the filing date of the above-identified original application for such invention.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed.

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U.S. Provisional Application Number	Filing Date

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I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of first inventor	Jennifer E. Curtis
Residence	Chicago, Illinois
Citizenship	United States
Post Office Address	5482 South Woodlawn, #2 Chicago, Illinois 60615
Inventor's signature	<i>Jennifer E. Curtis</i>
Date	May 1, 2002

VI

IN THE UNITED STATES PATENT OFFICE

In re application of:	Grier et al.)	
)	
Serial No:	09/845,045	)	Group Art Unit: 1775
)	
Filed:	April 27, 2001	)	Examiner: M. Y.
Sikder)	
)	
For:	APPARATUS FOR USING OPTICAL	)	Attny Dkt No. 40563/139
	TWEEZERS TO MANIPULATE)	
	MATERIALS)	

DECLARATION

I, David Grier, do hereby declare and state that:

I am an Associate Professor of Physics at the University of Chicago and have been a professor since 01/01/1992. In this position I supervise graduate students seeking a M.S. or Ph.D. degree. The new inventors which are to be added to this patent application, Brian Koss and Jennifer Curtis, were Ph.D. students under my direction while they were working on their Ph.D. thesis.

During the period of about February to April, 2001 I worked with Dr. Eric Dufresne to develop new ways to manipulate biological material using optical tweezers. Further, I enrolled the assistance of Mr. Brian Koss and Ms. Jennifer Curtis to develop some of the fundamental ideas as part of their Ph.D. thesis. In addition, we all worked together at various times to evaluate laboratory results and consider ways to enhance our ability to manipulate biological material without damaging the material. In various ways we collaborated in evaluating the use of laser light to manipulate biological material without causing consequent damage.

On or about April 21, 2001 I completed a draft of a scientific paper entitled "Using Visible Optical Tweezers to Manipulate Biological Samples" (see attached Exhibit A). At that time I was not principally concerned with the concept of naming inventors for a patent application which was to be prepared and filed very quickly to avoid loss of foreign patent rights (my

article was possibly going to be published in late April or early May, 2001). Therefore, the preparation of the patent application was ongoing while my article was being finalized for publication.

After I reviewed the patent application and after it was filed, I was provided various formal patent application papers, which I was asked to sign as an inventor and did so. I was unaware of any particular inventorship questions and understood this was being handled by UC Tech and its patent attorney, Mr. Michael D. Rechtin.

Several months after filing the patent application Mr. Rechtin contacted me to ask if Dr. Eric Dufresne was possibly an inventor on the patent application. We discussed that question, and I recall Mr. Rechtin concluded that Dr. Dufresne was also an inventor. I do not recall any other discussion about additional inventors at that time.

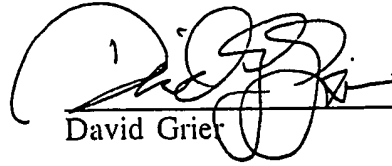
In late March, 2002 I was informed by Mr. Rechtin that the patent application had been allowed. In addition, I was contacted by Dr. Ginsburg of UC Tech who asked whether I recalled if Mr. Koss and Ms. Curtis were possibly inventors. At that time I did not recall their completing an Invention Disclosure form and suggested that Mr. Rechtin and Dr. Eric Ginsburg at UC Tech should be consulted to determine whether Mr. Koss and Ms. Curtis were in fact inventors on the final set of claims which would issue.

I had no deceptive intent to modify or change the named inventors on this patent application, and I have no knowledge of any deceptive intent on the part of anyone at the University of Chicago, or Mr. Rechtin, to change or modify the inventorship by not including Ms. Curtis and Mr. Koss.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

4/29/2002

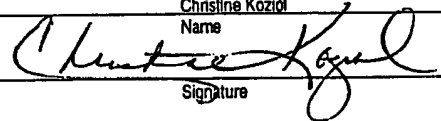
Date


David Grier

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on May 14, 2002

Christine Koziol

Name


Signature

SUPPLEMENTAL DECLARATION

As a below named inventor, I HEREBY DECLARE:

My residence, post office address, and citizenship are as stated below next to my name;

I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

APPARATUS FOR USING OPTICAL TWEEZERS TO MANIPULATE MATERIALS

the specification of which (check one)

 is attached hereto.

 X was filed on April 27, 2001 as United States Application Number or PCT International Application Number 09/845,045

I hereby declare that the subject matter of the (check one)

 attached amendment

 X amendment filed on February 4, 2002

was part of my or our invention and was invented before the filing date of the above-identified original application for such invention.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number	Country	Foreign Filing Date	Priority Claimed?	Certified Copy Attached?

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

U.S. Provisional Application Number	Filing Date
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I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or § 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Application Number	Parent Filing Date	Parent Patent Number

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of first inventor

David G. Grier

Residence

Chicago, Illinois

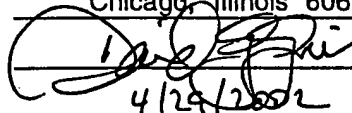
Citizenship

US

Post Office Address

1960 North Lincoln Park West
Chicago, Illinois 60614

Inventor's signature



Date

4/29/2002

VII

IN THE UNITED STATES PATENT OFFICE

In re application of:	Grier et al.)
)
Serial No:	09/845,045	) Group Art Unit: 1775
)
Filed:	April 27, 2001	) Examiner: M. Y. Sikder
)
For:	APPARATUS FOR USING OPTICAL	) Attny Dkt No. 40563/139
	TWEEZERS TO MANIPULATE)
	MATERIALS)

DECLARATION

I, Eric Dufresne, do hereby declare and state that:

I received a Ph.D. in Physics from the University of Chicago in August, 2000 and after graduation I continued collaborative research with my thesis advisor, Professor David Grier. During the period of about May, 2000 to August, 2000 I first worked with Professor Grier on the subject matter of the inventions.

During the period of about November, 2000 through January, 2001 I continued my work collaboratively with Professor David Grier to develop new ways to manipulate biological material using optical tweezers with visible wavelength light which avoided damage to certain biological materials. Further, I recall several discussions with Ms. Jennifer Curtis during thus latter period, but I do not recall specifically what was done. I therefore worked principally with Professor Grier to evaluate laboratory results and consider ways to enhance our ability to manipulate biological material without damaging the material. For example, it was well accepted that one could not use visible light lasers to manipulate biological material, due to alleged damage to the material. These efforts led to inventions for the present patent application. I do not, however recall being involved with the concept of reducing power of he optical traps to avoid damage to biological material. Consequently, I am an inventor on Claims 1-6 and 8-22 in which I made inventive contribution to the collection of elements of each claim.

In about July of 2001, I was asked by Mr. Rehtin, a patent attorney appointed by the University of Chicago, to review a patent application and claims to insure I was an inventor. I

reviewed these materials and completed certain formal papers indicating I was an inventor on the claims.

In late March, 2002 I was informed by Professor Grier that the subject patent application had been allowed.

I had no deceptive intent to leave out any inventors on this patent application, and I have no knowledge of any deceptive intent on the part of anyone at the University of Chicago, or Mr. Rehtin, to change or modify the inventorship by not including Ms. Curtis and Mr. Koss.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

May 3, 2002

Date

Eric R. Dufresne
Eric Dufresne

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on May 14, 2002

Christine Kozlov
Name

Christine Kozlov
Signature

Atty. Dkt. 0563/139

SUPPLEMENTAL DECLARATION

Comment: Make sure page numbers are correct. If not, go to Print Preview twice.

As a below named inventor, I HEREBY DECLARE:

My residence, post office address, and citizenship are as stated below next to my name;

I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

APPARATUS FOR USING OPTICAL TWEEZERS TO MANIPULATE MATERIALS

the specification of which (check one)

☐ is attached hereto.

☒ was filed on April 27, 2001 as United States Application Number or PCT International Application Number 09/845,045

Comment: Check filing date (if applicable)

I hereby declare that the subject matter of the (check one)

☐ attached amendment

☒ amendment filed on February 4, 2002

Comment: Check Application Number (if applicable)

was part of my or our invention and was invented before the filing date of the above-identified original application for such invention.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

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Comment: Check foreign priority application number (if applicable)

Prior Foreign Application Number	Country	Foreign Filing Date	Priority Claimed?	Certified Copy Attached?

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

Comment: Check U.S. Priority Provisional Application number (if applicable)

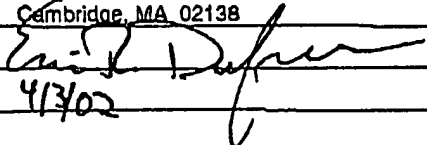
U.S. Provisional Application Number	Filing Date

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U.S. Parent Application Number	PCT Parent Application Number	Parent Filing Date	Parent Patent Number

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Name of second inventor	Eric R. Dufresne
Residence	Cambridge, MA
Citizenship	US
Post Office Address	69 Wendell St Cambridge, MA 02138
Inventor's signature	
Date	4/3/02